299-E28-74 (A6825)

Log Data Report

Borehole Information:

Borehole:	299-E28-74 (A6825)		Site:	241-B-361 Settling Tank	
Coordinates (WA State Plane)		GWL (ft)[1]:	Not reached	GWL Date:	N/A[2]
North	East	Drill Date	TOC[3] Elevation	Total Depth (ft)	Type
136,703.4 m	573,770.2 m	May 1979	689.2 ft	40	Cable Tool

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Steel Welded	0	6.625	6.0	0.3125	0	40

Borehole Notes:

The logging engineer measured the casing using a steel tape. One reference point survey "X" is located on top of the casing. Zero reference is the top of casing stickup. Top of casing stickup is cut squarely. HWIS[4] is the source of the TOC elevation and coordinates. Total depth and casing bottom are reported from information provided in Chamness and Merz (1993). The ground surface surrounding the borehole is rip-rap composed of crushed concrete 6- to 8-in. thick. On 05/31/02, the borehole was swabbed, and no contamination was detected.

Logging Equipment Information:

Logging System:	Gamma 1D		Type:	SGLS (35%)
Calibration Date:	7/01/01	Calibration Reference:	GJO-2002-243-TAR	
		Logging Procedure:	MAC-HGLP 1.6.5, Rev. 0	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2	Repeat Section		
Date	05/31/02	06/03/02	06/03/02		
Logging Engineer	Spatz	Spatz	Spatz		
Start Depth (ft)	41.0	21.5	27.0		
Finish Depth (ft)	20.5	0	32.0		
Count Time (sec)	100	100	100		
Live/Real	R	R	R		
Shield (Y/N)	N/A	N/A	N/A		
MSA Interval (ft)	0.5	0.5	0.5		
ft/min	N/A	N/A	N/A		
Pre-Verification	AD004CAB	AD006CAB	AD006CAB		
Start File	AD005000	AD006000	AD006044		
Finish File	AD005041	AD006043	AD006054		
Post-Verification	AD005CAA	AD007CAA	AD007CAA		
Depth Return	0	N/A	0		

Log Run	1	2	Repeat Section		
Error (in.)					
Comments	No fine-gain adjustment.	No fine-gain adjustment.	No fine-gain adjustment.		

Logging Operation Notes:

Zero reference is the top of casing for the SGLS logging. Logging was performed with a centralizer installed on the sonde. Pre- and post-survey verification measurements for the SGLS employed the Amersham KUT verifier with SN 118. Sometime after the completion of logging activities at 299-E28-74, the sonde experienced an electrical malfunction while logging well 299-E28-01 on June 3, 2002.

Analysis Notes:

Analyst:	Sobczyk	Date:	06/17/02	Reference:	MAC-HGLP 1.6.3, Rev. 0

SGLS pre-run and post-run verification spectra were collected at the beginning and end of each day. The verification spectra were all within the control limits except for spectrum AD007CAA. On May 31, 2002, the peak counts per second (cps) at the 609-keV, 1461-keV, and 261-keV photopeaks on the post-run verification spectrum as compared to the pre-run verification spectrum were 8 percent lower. On June 3, 2002, the AD007CAA verification spectrum failed to meet five of the six acceptance criteria. Examinations of spectra indicate that the detector appears to have functioned normally during the log run on June 3, 2002, and the log data are provisionally accepted.

Log spectra for the SGLS were processed in batch mode using APTEC Supervisor to identify individual energy peaks and determine count rates. The AD005CAA and AD006CAB verification spectra were used to determine the energy and resolution calibration for processing the data using APTEC Supervisor. Concentrations were calculated in EXCEL (source file: G1DJul1.xls), using parameters determined from analysis of recent calibration data. Zero reference is the top of the casing. The casing configuration was assumed to be one string of 6-in. casing with a thickness of 0.3125 in. to a log depth of 41 ft. This casing thickness was measured by the logging engineer. A water correction was not needed or applied to the SGLS data. Dead time corrections were not needed because dead time did not exceed 10.5 percent.

Log Plot Notes:

Separate log plots are provided for gross gamma and dead time, naturally occurring radionuclides (^{40}K, ^{238}U, and ^{232}Th), and man-made radionuclides. For each radionuclide, the energy value of the spectral peak used for quantification is indicated. Unless otherwise noted, all radionuclides are plotted in picocuries per gram (pCi/g). The open circles indicate the minimum detectable level (MDL) for each radionuclide. Error bars on each plot represent error associated with counting statistics only and do not include errors associated with the inverse efficiency function, dead time correction, or casing correction. These errors are discussed in the calibration report. A combination plot is also included to facilitate correlation.

Results and Interpretations:

^{137}Cs was the only man-made radionuclide detected in this borehole. ^{137}Cs was detected near the ground surface (1.0-ft log depth) with an activity near its MDL of 0.2 pCi/g.

Recognizable changes in the KUT logs occurred in this borehole. Increases in apparent ^{40}K activity of about 5 pCi/g occur at approximately 20 and 32 ft, while there is an apparent decrease of about 5 pCi/g in apparent ^{40}K activity at approximately 12 ft. The apparent ^{40}K activities above 20 ft are anomalously low probably due to the installation of a surface seal of grout around the casing (Chamness and Merz 1993). The increase in ^{40}K activities at 32 ft probably represents the finer grained sediments of the Hanford H2.

The plots of the repeat logs demonstrate reasonable repeatability of the SGLS data for both the man-made and naturally occurring radionuclides.

References:

Chamness, M.A., and J.K. Merz, 1993. *Hanford Wells*, PNNL-8800, UC-903, Pacific Northwest Laboratory, Richland, Washington.

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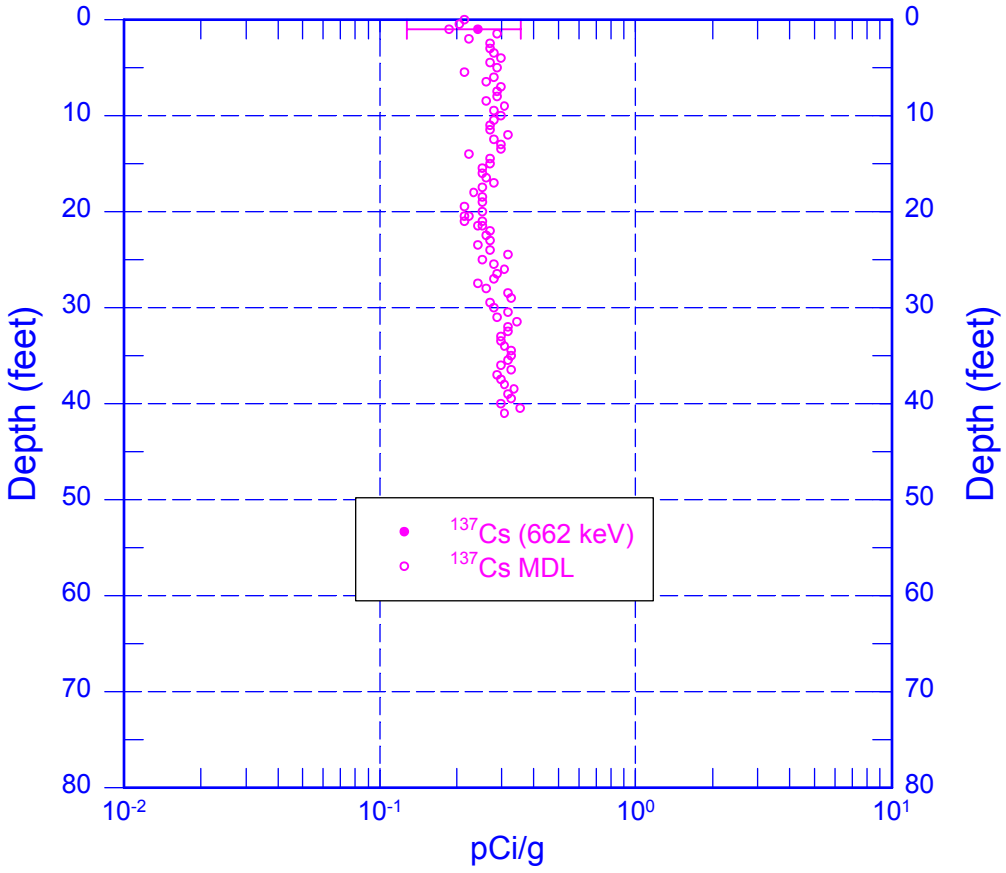
[1] GWL – groundwater level
[2] N/A – not applicable
[3] TOC – top of casing
[4] HWIS – Hanford Well Information System

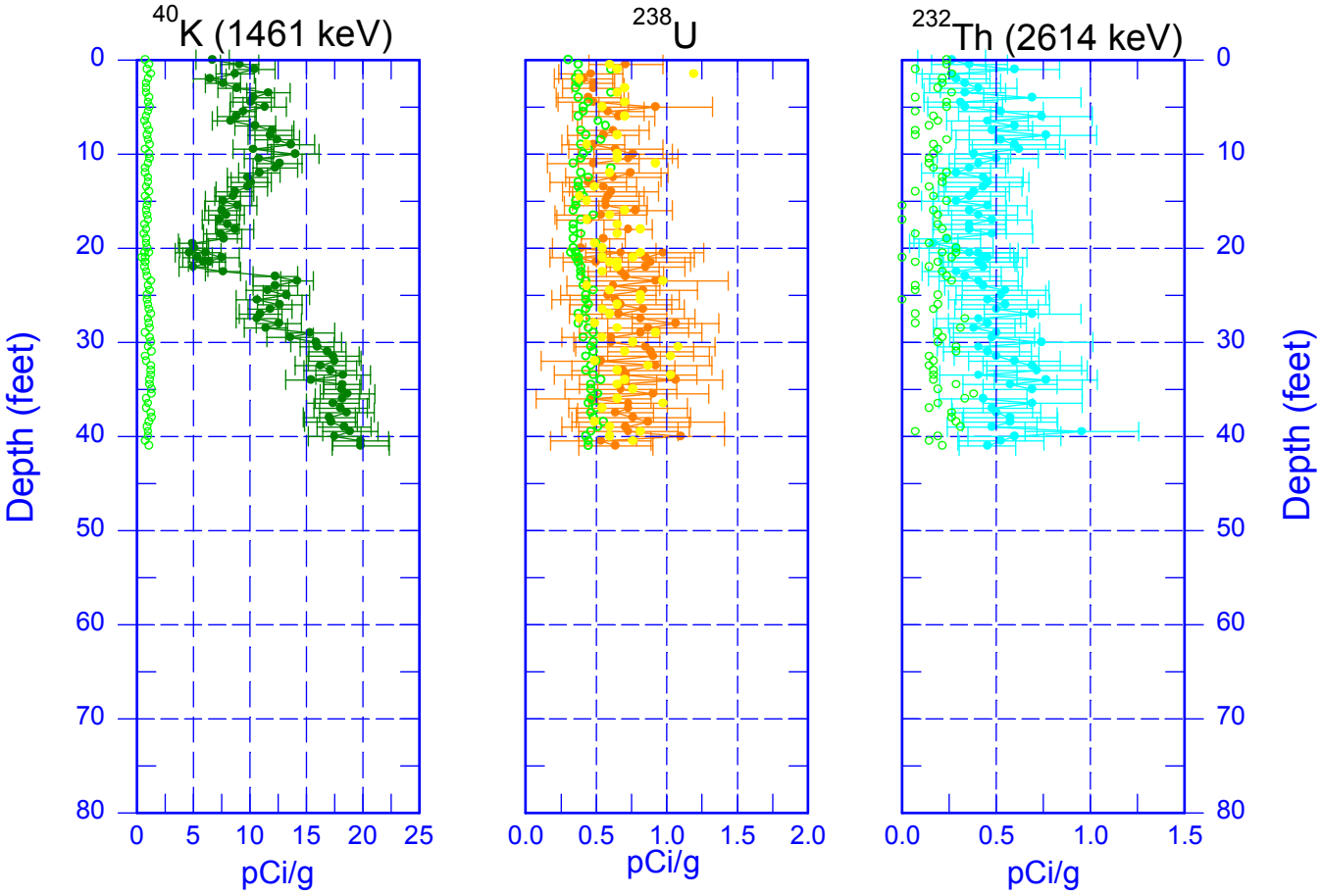
299-E28-74 (A6825)
Man-Made Radionuclides



Zero Reference = Top of Casing

Date of Last Logging Run
06/03/2002

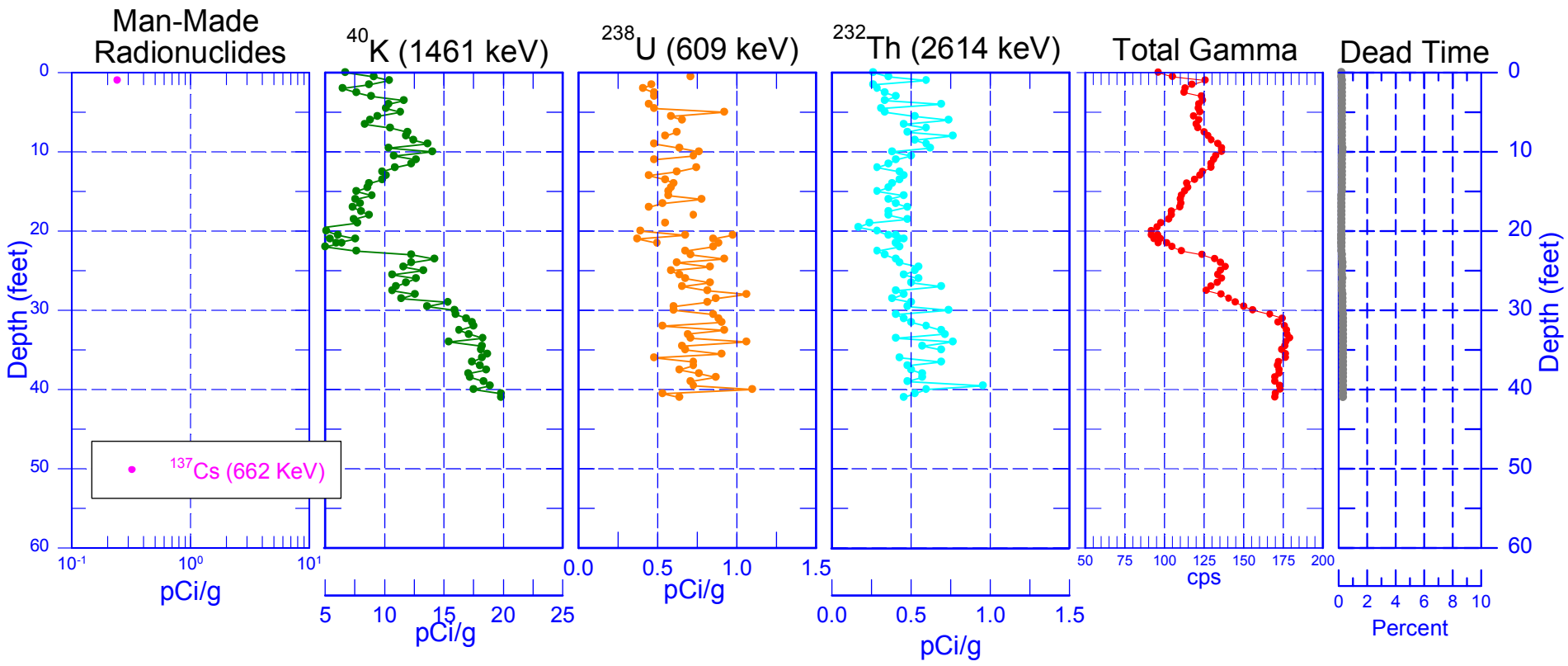
299-E28-74 (A6825)
Natural Gamma Logs



Zero Reference = Top of Casing

Date of Last Logging Run
06/03/2002

299-E28-74 (A6825) Combination Plot



Zero Reference = Top of Casing

Date of Last Logging Run
06/03/2002

299-E28-74 (A6825)
Total Gamma & Dead Time

Zero Reference = Top of Casing

Date of Last Logging Run
06/03/2002

299-E28-74 (A6825)

Rerun of Natural Gamma Logs (27.0 to 32.0 ft)